DOCUMENT RESUME

ED 061 066 SE 013 401

TITLE	The Case for Environmental Education. A Collection of Readings in Environmental Awareness.
INSTITUTION	Office of Education (DHEW), Washington, D.C.
PUB DATE	71
NOTE	53p.
EDRS PRICE	MF-$0.65 HC-$3.29
DESCRIPTORS	*Environment; Environmental Education; Essays; Literature Reviews; *Perception; *Reading Materials; Reference Materials

ABSTRACT

Embodied in this collection of readings in environmental awareness are excerpts, statements, testimony, and personal philosophies presented by national leaders concerned with our environment. Major items include: "Environmental Literacy" by Richard Nixon from his introduction to the First Annual Report of the Council on Environmental Quality, August, 1970; "The Insatiable Monster" by Prince Philip, Duke of Edinburgh, excerpted from a speech on the preservation of the countryside; "Ecological Crisis Demands New Ethic of Responsibility" by Dr. George Harrar, President, Rockefeller Foundation; "The Church and Man's Relationship to the Environment" by Richard Baer, Earlham College, Indiana; "The Value of Good Design" by Nathan Cabot Hale, sculptor; testimony before the House Select Subcommittee on Education hearings on environmental education, 1970; and statements appearing in the "Background Book" of the 13th National Conference of the U.S. National Commission for UNESCO, California, 1969. (BL)

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THE CASE FOR ENVIRONMENTAL EDUCATION

A COLLECTION OF READINGS IN
ENVIRONMENTAL AWARENESS

Office of Education
U.S. Department of Health, Education, and Welfare
Washington, D.C. 20202

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Key role in basic reform...

ENVIRONMENTAL LITERACY*

By Richard Nixon,
President of The United States

"Environment" is not an abstract concern, or simply a matter of esthetics, or of personal taste--although it can and should involve these as well. Man is shaped to a great extent by his surroundings. Our physical nature, our mental health, our culture and institutions, our opportunities for challenge and fulfillment, our very survival--all of these are directly related to and affected by the environment in which we live. They depend upon the continued healthy functioning of the natural systems of the Earth.

Environmental deterioration is not a new phenomenon. But both the rate of deterioration and its critical impact have risen sharply in the years since the Second World War. Rapid population increases here and abroad, urbanization, the technology explosion and the patterns of economic growth have all contributed to our environmental crisis. While growth has brought extraordinary benefits, it has not been accompanied by sufficiently foresighted efforts to guide its development.

At the same time, in many localities determined action has brought positive improvements in the quality of air or water--demonstrating that, if we have the will and make the effort, we can meet environmental goals. We also have made important beginnings in developing the institutions and processes upon which any fundamental, long-range environmental improvement must be based.

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* From the President's introduction to the First Annual Report of the Council on Environmental Quality, August 1970.

The basic causes of our environmental troubles are complex and deeply imbedded. They include: our past tendency to emphasize quantitative growth at the expense of qualitative growth; the failure of our economy to provide full accounting for the social costs of environmental pollution; the failure to take environmental factors into account as a normal and necessary part of our planning and decision-making; the inadequacy of our institutions for dealing with problems that cut across traditional political boundaries; our dependence on conveniences, without regard for their impact on the environment; and more fundamentally, our failure to perceive the environment as a totality and to understand and to recognize the fundamental interdependence of all its parts, including man himself.

It should be obvious that we cannot correct such deep-rooted causes overnight. Nor can we simply legislate them away. We need new knowledge, new perceptions, new attitudes--and these must extend to all levels of government and throughout the private sector as well: to industry; to the professions; to each individual citizen in his job and in his home. We must seek nothing less than a basic reform in the way our society looks at problems and makes decisions.

Our educational system has a key role to play in bringing about this reform. We must train professional environmental managers to deal with pollution, land planning, and all the other technical requirements of a high quality environment. It is also vital that our entire society develop a new understanding and a new awareness of man's relation to his environment--what might be called "environmental literacy." This will require the development and teaching of environmental concepts at every point in the educational process.

While education may provide ultimate answers to long-range environmental problems, however, we cannot afford to defer reforms which are needed now. We have already begun to provide the institutional framework for effective environmental improvement.

Lately, our attention as a people has repeatedly and insistently been seized by urgent concerns and immediate crises: by the sudden blanketing of cities or even whole regions with dense clouds of smog, for example, or the discovery of mercury pollution in rivers. But as we take the longer view, we find another challenge looming large: the mounting pressures of population. Both the size and the distribution of our population have critical relevance to the quality of our environment and thus to the quality of our lives.

Population growth poses an urgent problem of global dimensions. If the United States is to have an effective voice in world population policies, it must demonstrate willingness to face its own population problems at home.

The particular impact of any given level of population growth depends in large measure on patterns of land use. Three quarters of our people now live in urban areas, and if present trends continue most of them in the future will live in a few mammoth urban concentrations. These concentrations put enormous pressure on transportation, sanitation and other public services. They sometimes create demands that exceed the resource capacity of the region, as in the case of water supply. They can aggravate pollution, overcrowd recreation facilities, limit open space, and make the restorative world of nature ever more remote from everyday life. Yet we would be blind not to recognize that for the most part the movement of people to the cities have been the result neither of perversity nor of happenstance, but rather of natural human aspirations for the better jobs, schools, medical services, cultural opportunities and excitement that have traditionally been associated with urban life.

If the aspirations which have drawn Americans to the city in the first instance and subsequently from the city core to the suburbs are often proving illusory, the solution does not lie in seeking escape from urban life. Our challenge is to find ways to promote the amenities of life in the midst of urban

development: in short, to make urban life fulfilling rather than frustrating. Along with the essentials of jobs and housing, we must also provide open spaces and outdoor recreation opportunities, maintain acceptable levels of air and water quality, reduce noise and litter, and develop cityscapes that delight the eye and uplift the spirit.

By the same token, it is essential that we also make rural life itself more attractive, thus encouraging orderly growth in rural areas. The creation of greater economic, social, cultural, and recreational opportunities in rural parts of the country will lead to the strengthening of small cities and towns, contributing to the establishment of new growth centers in the nation's heartland region.

Throughout the nation there is a critical need for more effective land use planning, and for better controls over use of the land and the living systems that depend on it. Throughout our history, our greatest resource has been our land--forests and plains, mountains and marshlands, rivers and lakes. Our land has sustained us. It has given us a love of freedom, a sense of security, and courage to test the unknown.

We have treated our land as if it were a limitless resource. Traditionally, Americans have felt that what they do with their own land is their own business. This attitude has been a natural outgrowth of the pioneer spirit. Today, we are coming to realize that our land is finite, while our population is growing. The uses to which our generation puts the land can either expand or severely limit the choices our children will have. The time has come when we must accept the idea that noneof us has a right to abuse the land, and that on the contrary society as a whole has a legitimate interest in proper land use. There is a national interest in effective land use planning all across the nation.

I believe that the problems of urbanization which I have described, of resource management, and of land and water use generally can only be met by comprehensive approaches which take into account the widest range of social, economic, and ecological concerns.

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The prospect of increasing population density adds urgency to the need for greater emphasis on recycling of "waste" products More people means greater consumption--and thus more rapid depletion--of scarce natural resources; greater consumption means more "waste" to dispose of--whether in the form of solid wastes, or of the pollutants that foul our air and water.

Yet much of this waste is unnecessary. Essentially, waste is a human invention: Natural systems are generally "closed" systems. Energy is transformed into vegetation, vegetation into animal life, and the latter returns to the air and soil to be recycled once again. Man, on the other hand, has developed "open" systems--ending all too often in an open sewer or an open dump.

We can no longer afford the indiscriminate waste of our natural resources; neither should we accept as inevitable the mounting costs of waste removal. We must move increasingly toward closed systems that recycle what now are considered wastes back into useful and productive purposes. This poses a major challenge--and a major opportunity--for private industry.

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As our government has moved ahead to improve our environmental management, it has been greatly heartening to me to see the extent and effectiveness of citizen concern and activity, and especially the commitment of young people to the task. The job of building a better environment is not one of government alone. It must engage the enthusiasm and commitment of our entire society. Citizen organizations have been in the forefront of action to support strengthened environmental programs.

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Similarly, the active participation of the business community is essential. The government's regulation and enforcement activities will continue to be strengthened. Performance standards must be upgraded as rapidly as feasible. But regulation

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cannot do the whole job. Forward-looking initiatives by business itself are also vital--in research, in the development of new products and processes, in continuing and increased investment in pollution abatement equipment.

On the international front, the level of environmental concern and action has been rapidly rising. Many of our most pressing environmental problems know no political boundaries. Environmental monitoring and pollution of the seas are examples of major needs that require international cooperation, and that also provide an opportunity for the world's nations to work together for their common benefit.

In dealing with the environment we must learn not how to master nature but how to master ourselves, our institutions, and our technology. We must achieve a new awareness of our dependence on our surroundings and on the natural systems which support all life, but awareness must be coupled with a full realization of our enormous capability to alter these surroundings. Nowhere is this capability greater than in the United States, and this country must lead the way in showing that our human and technological resources can be devoted to a better life and an improved environment for ourselves and our inheritors on this planet.

Our environmental problems are very serious, indeed urgent, but they do not justify either panic or hysteria. The problems are highly complex, and their resolution will require rational, systematic approaches, hard work and patience. There must be a national commitment and a rational commitment.

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The newly aroused concern with our natural environment embraces old and young alike, in all walks of life. For the young, it has a special urgency. They know that it involves not only our own lives now but the future of mankind. For their parents, it has a special poignancy--because ours is the first generation to feel the pangs of concern for the environmental legacy we leave to our children.

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At the heart of this concern for the environment lies our concern for the human condition: for the welfare of man himself, now and in the future. As we look ahead to the end of this new decade of heightened environmental awareness, therefore, we should set ourselves a higher goal than merely remedying the damage wrought in decades past. We should strive for an environment that not only sustains life but enriches life, harmonizing the works of man and nature for the greater good of all.

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ENVIRONMENTAL PROBLEMS

From "Toward Balanced Growth: Quantity with Quality," Report of the President's National Goals Research Staff.

Man is redefining his relationship to his environment. He has progressed from fearing to understanding, to using, to abusing, and now to worrying about the physical and biological world about him. Throughout all but the very recent history of the United States, our relationship to the environment has been one of exploitation. We have seen our natural endowment as a source of riches to be extracted and used, or later, to be extracted and processed. Concern for the environment was generally limited to whether or not we were exhausting our inheritance of sources of food, energy, and materials.

The current interest in the environment has two distinctively novel emphases. The first is that the limitations that the environment places on our activities may not be on the input side (sources of food, energy, and materials), but on the output side (a place to dispose of our wastes). The second, which is closely related to the first, is that the environment, in addition to having a limited capacity to absorb wastes, is a complex ecological system in which intervention of an apparently minor sort can, and often does, have far-reaching consequences through a chain of unsuspected reactions.

Both of these aspects of thinking about the environment have important consequences on the way we think about other things. They raise the question of whether or not there may be an upper limit on our economic growth as a consequence of the limitations on how much waste can be absorbed. And, the model of complex ecological systems affects our whole way of thinking about the consequences of our action not only in the environmental sphere, but also in the social sphere where we are coming to realize that causation is just as complex.

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Some scientists and other anxious citizens assume a doomsday model of the future in which increased economic production will drive us to our destruction. In response, others propose what is called a paradise-regained model which would return us almost to a state of nature. Fortunately, the doomsday model does not forecast that which is inevitable, and the latter, which would probably be unattainable if tolerable, need not be entertained.

A mixed strategy of response to our environmental problems is proposed. We need to expand our inadequate knowledge of ecological systems. But while expanding this knowledge, we must take those measures which we know are called for. We need to consider our current technological and economic alternatives in the light of long-range ecological balance. Additionally, we need to resolve conflicts between our demands for products and services, and the depletion and pollution. generated by them.

The market mechanism can and should be used as one of the devices for regulating these demands. Government should play a role through appropriate regulations, taxes, subsidies, and standard setting. Since environmental problems and their solution are of a global nature, we must and are beginning to act in concert with the other nations of the world.

Our environmental problems are a result of our technological and economic successes and of our philosophical view of nature. Now we must learn to use our technology and our economic output better to bring us in harmonious relationship to that environment. As will be found in other sections of this report, it is becoming apparent that the relatively narrow criteria by which we have, in the past, judged technical and economic progress must be expanded to consider a wider range of consequences.

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THE ENVIRONMENTAL CRISIS*

By Kenneth E. Boulding, Institute of
Behavioral Sciences, University of Colorado

The ecological crisis which is reflected in the intense activity around "Earth Week" in April 1970, is perhaps more a reflection of a change in man's awareness of himself and his environment than of any immediate change in the environment itself. It is significant that the intense interest in the environment this year has been generated not by any dramatic ecological crisis, such as the dust bowl and the dust storms of 1934, which produced the Soil Conservation Service, but rather by a sudden increase in awareness on the part of considerable numbers of concerned people, about the dangers of the course the human race is taking and the possibility of ecological disasters in the future.

The threat to the environment is created by the fact that virtually all human activity produces both goods and bads--that is, negative goods--in processes of joint production.

Hence, unless there are elements in the structure and organization of society to correct these processes, the increased production of goods, which is what we mean by economic development, almost inevitably produces likewise an increased production of bads.

If we want to increase agricultural productivity, we have to put artificial fertilizers on the soil, which runs off into the rivers and makes them--as ecologists say--eutrophic; that is good for algae but bad for humans.

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* From testimony before the House Select Subcommittee on Education hearings on environmental education, May 1, 1970.

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If we want the freedom, mobility and social equality which is a product of the automobile--and I have to make the awful confession that I like driving my car--we are also going to produce a large amount of atmospheric pollution. If we want the possibly illusory sense of security which a large military establishment gives us, we must also face a positive probability of nuclear war and the almost irretrievable ecological disaster which this would produce.

Even the present excitement about the environment has produced a certain amount of nonsense--academic nonsense--along with the wisdom which might be informative.

The intelligent response to these problems is to set up a social structure and organization which will encourage those forms of human activity and processes of production which produce more goods and less bads and which particularly produce those bads--if we have to produce them--which have a short length of life and so quickly disappear, for one of the nice things is that bads do depreciate.

This can be done in many ways, through the tax system, for instance, by taxing the production of bads, through such devices as effluent taxes and taxes on automobiles, graduated according to the amount of pollution they produce.

It can be done also by what we might call counter-organization, through the development of governmental research, through watchdog organizations which can detect and restrain pollution, and so on. You might call this the institutionalizing of Mr. Nader.

These structures and organizations, however, will not be created unless there is wide public awareness of the nature of the issues. This can be done most effectively through the educational system.

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BUILDING A QUALITATIVE ENVIRONMENT*

By Matthew J. Brennan
UNESCO International Director of the
Venezuelan Conservation Curriculum Project

In the United States today, we are witnessing a cultural revolution. For the first time in our history as a nation, our people are becoming concerned with the deteriorating quality of the environment in which they are forced to live. We are rapidly approaching a crisis--not the "quiet crisis" about which former Secretary of the Interior Udall wrote but a noisy, clamoring crisis in which men will struggle for space in which to live and play, air fit to breathe, and water fit to drink, not to mention food that is not contaminated by poisons and additives of one type or another designed to enhance its appearance or preserve it from the processes of oxidation and decay.

Concern for the quality of the environment was first voiced by scientists, then by social scientists, now by people in all segments of society. As in all social crises of the past, the American people have turned to education for solutions. Yet for reasons that elude understanding, education in America is not prepared to offer solutions. Although our heritage as a nation is closely bound to the outdoors--to the natural environment--our educational system does not reflect this tie. Where the environment has been studied, man has not been considered as a part of it.

In developing a strategy for education for an environment of quality, let us make one major assumption. If man is the only living thing which can consciously transform, manipulate, control, preserve or destroy his environment, then a knowledge of <u>how</u> he affects his environment and, perhaps

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even more important, of the consequences of his actions should be an essential element of human understanding. It is not, and the reason it is not represents a failure of American education.

What is environmental education? It is that education which develops in man a recognition of his interdependence with all of life and a recognition of his responsibility to maintain the environment in a manner fit for life and for living --an environment of beauty and bounty in which man lives in harmony. The first part of environmental education involves development of understanding; the second, development of attitudes-- a "conservation ethic."

Understanding the environment and man's activities in it certainly involves the sciences. Indeed, an understanding of the chemistry, geology, physics, and biology of the environment is basic. But many scientists have themselves learned that decisions regarding man's actions in and use of his environment and its resources are not always made on the basis of scientific knowledge. We have the knowledge to solve most of the new environmental problems--population, pesticides, pollution, poverty of the environment (I call them the "P" problems). But decisions are being made, and will increasingly be made, on the basis of social desirability, economic feasibility, or political expediency (have you noticed how many politicians have suddenly become environmental protectors?). The social sciences must therefore also be an important segment of environmental education. And since natural beauty, esthetics and the ennobling elements of the environment are receiving increased attention, the humanities must come within the purview of our program.

Most important, we can no longer segment our subjects. Discussions of population, pesticides, pollution and poverty of the environment are by nature interdisciplinary. How can you separate the scientific, religious and social aspects of population; the scientific esthetic and social aspects of resource use; the scientific and esthetic aspects of wilderness preservation?

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We are really talking, then, about a new kind of education--I call it education for the total environment--which involves understanding of the external environment. But, if we are to accomplish the second part of environmental education--the development of a "conservation ethic," an attitude of responsibility for the environment--then our education must involve the inner environment of the child as well. We know that life styles and attitudes are formed at an early age. The reasons why people "conserve" are internal, and we will fail if we do not develop in children a good inner environment. Why should the child who has not been conserved be concerned about wilderness, California condors, or Antarctic penguins? Where is esthetics taught in our schools?

To attain our objective--education for the total environment--we must develop total environments for education.

Obviously, the most efficient laboratory for experiences in search of meaning in the environment is the environment. Yet, in most schools every element of the school facility but the surrounding environment is used. Our teachers are trained to use textbooks, guides, machines, media equipment, indoor laboratories--but never the real laboratory just outside the school. In most schools, the teacher is discouraged from using the surroundings as a laboratory. He can make TNT in the laboratory and be fully covered by insurance if the school blows up. No parental permission is required. Yet, if he wants to take his class out-of-doors he needs both parental permission and insurance against injury. Is it any wonder the average American knows little about his environment?

The outdoor laboratory must become an essential element of every school facility, extending eventually into the community. Here learning can go on naturally. Here the child can fail without penalty--and learn from his failure. Here he can become part of his environment and his environment a part of him--it will conserve him; he will conserve it.

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What understandings are we talking about? Three great conceptual schemes govern all of life on earth, including man:

1. Living things and environments are in constant change.

2. Living things are interdependent with one another and with their environment.

3. Living things, or populations of living things, are the product of their heredity and their environment.

Although these concepts are complex in nature, an understanding of them and their relationship can be developed quite simply, in this way:

Since man is the principal agent of change in the environment, we can look for rapid changes as a result of his activities. Children can be taught to look for change. Change results in a new environment--when man adds poisons, builds dams or roads, or kills predators, new environments are created. Now we must look for consequences, since all living things are dependent on their environments. What effect does the change have? Can we predict it? Did we foresee polluted water from detergents that gave us the whitest washes in the world? Did we foresee DDT in the tissues of Antarctic penguins when we sprayed the forests and farms of America to control insects? We must expect consequences when new environments result from change.

Finally, we must try to determine how living things will survive in the new environment. Not all living things have been adapted for life under changed conditions. Our list of endangered species is long. Perhaps man may be on the list; some scientists believe so. Can man survive the pollution, poisons, crowding, noise, etc., that he has introduced into his environment?

As educators we must believe that education for these three basic concepts of life on earth will give man the understanding necessary for his life as a member of the planet earth environment.

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THE GRASS-ROOTS ORGANIZATION*

By A. J. W. Scheffey, Director, Center for Environmental Studies, Williams College

The basic question that more and more people are asking today is "who's in charge?" Whose landscape is it, who is to blame, isn't there something that can be done about it? Response seems to be surfacing and it is growing in most instances from the people. New coalitions are emerging from the various kinds of grass root groupings noted earlier: their goals are becoming broader, more comprehensive. Environmentally concerned "movements" are taking shape and starting to question traditional patterns of political response, as well as the sanctity of the established economic order and those traditional institutional arrangements that link communities and individuals to their environment. Storm King, the Redwoods, San Francisco Bay and Santa Barbara, the mushrooming growth of the municipal conservation commission development, AEC hearings, and highway review procedures are all indicators.

Perhaps we are in the beginning of a new stage of history in terms of defining and acting upon the concept of public interest as it relates to the public environment. Environmental values and interests are not as readily measured and translated into policy as have been past interests, worked out through a political system based largely upon the economic ethic and military institutions. Environmental interests are more subjective and intuitive, and they extend into a future only dimly perceived today.

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* From the "Background Book", 13th National Conference of the U.S. National Commission for UNESCO, San Francisco, November 23-25, 1969.

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But it is now clear that we do need a spokesman for the public environment, a political constituency for the biosphere in which man lives. If there is evidence that this is starting to develop, much credit must be given to the past record of accomplishment of our grass roots organizations.

In conclusion, I would reaffirm my belief that the quality of environments that we eventually achieve will be determined largely by the images of the future that we are able to create. But the formation of such images will have to start in the minds of individuals. This is what the grass roots organization of today should really be about.

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A NEW AWARENESS OF THE ENVIRONMENT*

By Edward W. Weidner, Chancellor
University of Wisconsin, Green Bay

The awareness of the crisis now sweeping our society is all to the good. Without such awareness, there would be no hope of mobilizing the great concentrations of resources and manpower that are going to be required.

Few, if any of us, however, can have any accurate concept of the effort, the ingenuity, the determination, and the cost that will be required to translate this awareness into effective action in support of environmental quality. The reason is that we are dealing with a situation that requires us to abandon or substantially modify certain attitudes and beliefs that have been a part of our conventional wisdom for generations, even for centuries. To mention a single and extremely troublesome example, there is the problem of population control. You are all familiar with its ramifications. They read into every area of our lives, including the most personal. If basic changes in our individual and societal attitudes in this area are to be made, we face an educational task that dwarfs anything we have accomplished in the past. The size of the task is amplified by the limited time we have to accomplish it.

While population control may be the single most difficult problem we must face in the immediate future, there are others that are not far behind it in magnitude and complexity. Some problems, such as war and poverty, are very old and may not at first glance appear to be environmentally relevant. But we are beginning to see such social phenomena in a new context, as contributing to and being affected by ecological factors.

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*From testimony before the House Select Subcommittee on Education hearings on environmental education, March 26, 1970.

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Conceivably, this new way of viewing our situation could lead us to solutions not apparent before. The ecological view does reveal the inescapable relatedness of all of us with each other and of man and his works as a whole with the biophysical environment that produces and sustains life.

In this formulation, you will recognize overtones of the great religious and philosophical concepts that form the heart of our cultural heritage. We are not discovering new truths about the requirements of our existence, except perhaps in a technological sense. But we are rediscovering with great urgency that application of the old truths to the realities of our environmental situation may quite literally be the price of our survival. Because this discovery seems to be taking place on a national and even on a world basis, I am convinced that we are entering on what will prove to be the most hopeful and creative of the ages of man.

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THE INSATIABLE MONSTER*

By Prince Philip

In the years after the war, it was widely believed that science, technology and economic measures were the hope of the future; they were to be great deliverers from drudgery and the promise of a Golden Age. Perhaps we put too much faith in them, perhaps we expected too much from this form of materialism.

Today we recognize that they must be wisely controlled.

At any rate, they too are now under scrutiny and people are beginning to count the cost of the massive technological developments that have taken place in the last 50 years in terms of the damage to human existence. No one denies the convenience of the gadgets and the equipment that have been produced, but the side effects are beginning to look extremely worrying.

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The search for the exploitation of resources to feed this insatiable technological monster; the exploitation of human resources to manage it and the mountains of waste it produces all result in the gradual erosion of our whole living environment. There are those who believe that the environmental decay has gone so far as to be virtually irreversible and that the capacity of the planet earth to support any more human life for more than a limited period has already been reached.

I believe this is an unnecessarily gloomy view. We have sufficient successes to encourage further effort.

We have time--but not much.

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* Excerpted from a speech on the preservation of the countryside by the Duke of Edinburgh.

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The trouble is that conservation of the environment cannot be measured directly in economic terms. Indeed, whenever conservation gets into an economic argument, it is inevitably made to look as if it were opposed to all forms of economic development.

When a national park stands in the way of the exploitation of a natural resource, such as potash for example, the national interest measured in the economic terms of exports and balance of payments wins every time.

Economic advantage is easily measured in cash terms; social cost is just a figure of speech. The Gross National Product, which is rapidly assuming the religious significance of a graven image, can be worked out by any competent accountant, but exactly how do you arrive at a comparable figure for the quality of life?

The trouble is that conservation is a cultural, moral, ethical or even a religious issue. It is to do with belief and conscience, it is to do with future generations and the fate of the world as the habitat for all forms of life as we know it.

The fact is that the subject of conservation has become a large and extremely awkward spanner in our well-oiled, materialist economic system. We have got to the point where we believe that every problem is an economic problem and if something can't be measured directly in terms of money, it just doesn't exist. Because conservation is a new and awkward problem, I suspect many people fondly hope that by ignoring it, the problems will quietly go away.

Unfortunately, the deterioration of the environment does exist for every observant individual to notice. It is not a figment of a crank's imagination or a Communist plot or another phase in the class struggle or even a gimmick by the industrially advanced countries to stop the developing countries enjoying a higher standard of living.

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Attempts to argue away unpleasant situations is a classic human characteristic and if that doesn't work, the next trick is to suggest that the problem is nothing like as serious as the alarmist would have us believe. Exaggeration is of course possible

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in both directions, but just because you would prefer an accidentally encountered elephant to be the size of a mouse doesn't actually make it so.

If argument and minimizing fail, the next fall-back position is ridicule. If you can make enough fun of it, perhaps it would get embarrassed and look less menacing. Finally, if all else fails, the usual behavior is to get into a panic and run away.

I believe we can do better than that. I believe that if we are sensible and rational about this, we can work out an arrangement that will allow us to keep the situation under review and under control; we can establish an organization with the necessary responsibility and executive powers and we can devise priorities and programmes of public information and research.

Conservation problems are no more static than economic problems. We know about the backlog of abuses that need to be corrected but, while we make the necessary corrections, new and unexpected problems will certainly appear. We will only be able to deal with past mistakes and future hazards if we can rely upon an effective system of warning, research and executive action.

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ENVIRONMENTAL EDUCATION

From "Evironmental Quality," the First Annual Report of the Council on Environmental Quality, August 1970

When it began to dawn on people that the environment was worsening, that blight was creeping across our land, that the air was polluted and the waters running with waste, one of the first questioning glances was toward education. Our educational systems were caught off guard by the decline in environmental quality. They were no more ready to cope with the decay than any other part of society. Now in the face of the challenge the systems must be broadened to include new perceptions of environmental education.

What do we méan by "environmental education"? Nobody is certain. It has never been adequately defined. Education at least should help the student understand how the natural world works, not just its parts, but the relationships of one to another. He must appreciate not only man's dependence on the contribution to ecosystems, but the ways and degrees by which modern man alters them. As history cannot be adequately seen just as a series of acts, dates, battles, and names, but as the fabric of our past in relationship to our present, so environment cannot be seen but as a web of relationships.

This need not necessarily mean that ecology should replace any particular course of study or that education should be devoted entirely to ecology. But it does mean that there is a need for interdisciplinary education to cope with the interrelated nature of the environment. It is clear that man does not know enough about the environment around him and what he is doing to it.

He has been a sorcerer's apprentice. He has loosed forces he only partly understands and can only partly cope with. It is not enough that experts know--and even they know precious little--but it is mandatory that the people who must live in the environment learn more about the forces that

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now move in sometimes dangerous ways upon it. Environmental education therefore is a key to making this a livable world.

That means, at the minimum, a fuller understanding of how the natural world works and how man is changing it. A better idea of how our economic systems and political institutions influence the choices that set off chain reactions within our environment, and a shift in personal values to make us willing to pay the price of controlling pollution, will both be necessary.

The Council is not ready yet to suggest how these needs must be woven into America's educational system. The picture is beset with too many conflicting, but legitimate, positions. They should be thoroughly debated.

Environmental education is not only "conservation education," Nor is it only the sum of the antipollution concerns that have recently captured public imagination. An "environmentally literate" individual is one who understands that he is part of a system composed of people, culture, and his physical and natural surroundings. He knows that man's acts can change his relationships to this system. He appreciates the human ability in some degree to control, preserve, and destroy the evironment. He accepts responsibility for the condition of his environment. But that does not mean that he knows what to do about it.

A mere scientific study of earth's life support systems is inadequate. Environmental decisions are also based on economic and political factors, social pressures, and cultural values. Many Americans live most of their lives in cities. So it is essential that environmental education be relevant to them. That means that it must stress social and behavioral sciences. It should deal with what the student's environment is and might be. More colleges must begin to weave environmental content into science, technology, law, government, and education courses. And for the long run, perhaps more important than any of these actions, preschool, elementary, and secondary school students

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must be exposed to environmental learning. That exposure involves curriculum development, teacher training, and organizational reform of a type and on a scale that do not now exist.

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EDUCATION's RESPONSE TO AWARENESS NEEDS*

By Paul DeHart Hurd, Professor of Education,
Stanford University

Schools and colleges, being conservative institutions, respond slowly to changing bio-social conditions. There is agreement that education has a responsibility to provide people with the knowledge and skills needed for survival. The problem is not with the goal but its implementation. For the first time in history man is forced to consider the question of renewing the balances within the biosphere to sustain the quality of human life. Ironically, it is man that has created the environmental imbalances which now threaten his existence.

Although we live in an age largely determined by science, we do so without the enlightenment necessary for a scientific age. A mismatch has developed between science, technology, education, and society--this is a condition we can no longer safely endure. In part, the situation has arisen because school curricula are based on the assumption that tomorrow will differ little from yesterday.

The present orientation of education distorts the efforts of young people to understand ecological health within the framework of a humane society. The knowledge demanded to attack these problems is isolated within separate disciplines, and is taught without regard to its relevance for man's existence. The curriculum organization that is called for must insure collaboration between the social and natural sciences, including the humanities and engineering, if man is to plan responsibly for improving his environment. Teaching will need to be in an interdisciplinary context where the focus is upon man and the subject matter transcends the classroom. This assumes that man's intelligence, fortified with knowledge and awareness, can produce and sustain an environment favorable for his existence.

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* From the "Background Book", 13th National Conference of the U.S. National Commission for UNESCO, San Francisco, November 23-25, 1969.

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An education for survival is an education for change and social action, directed toward the future we seek. To educate for change is to educate for instability, versatility, and adaptability. Individual motives must be linked with the common good. The knowledge components required for the curriculum are those having a high potential for ecological conceptualization. To make rational use of knowledge requires skills in a wide range of logical processes and inquiry procedures, along with the canons of validity which characterize diverse disciplines.

Little progress will be made on man's environmental problems unless we can reduce the present polarity within the curriculum and establish interdisciplinary courses and programs. This will require scholars to establish mechanisms and institutions for the study of man within a matrix of bio-social concerns. Students will need opportunities to project themselves into different aspects of environmental improvement. These opportunities are now limited by an education that is too specialized and, moreover, meaningless for contemporary times.

Some progress along these lines is evident. For example, environmental studies are becoming more conspicuous in university catalogs, along with courses in human behavioral biology, human ecology, and social biology; in most instances these are interdisciplinary courses. The Biological Sciences Curriculum Study is proposing a two-year life science program for the middle school built around a systematic study of man and his environmental interactions. SGAD (Students Give a Damn), a self-organized group of students from various colleges and universities, is fighting to have science taught with a concern for "the alleviation and solution of current problems now threatening the environment of man." The eco-activist is becoming increasingly conspicuous among both students and faculties. Of considerable significance is the recent establishment of an Office of

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Environmental Education in the Department of Health, Education, and Welfare. These efforts represent a beginning, but they are not adequate for the task and will not be until programs of general education include integrative studies focused on man and his ecological responsibilities.

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AVOIDING DETOURS*

By Margaret Mead, Anthropologist and Director,
American Museum of Natural History

There are a lot of people who enjoy producing endless red herrings by saying that we are doing something instead of something else. There is a group of people in this country who say that the whole environmental ploy was invented by the establishment in order to take the students' minds off the Vietnam war. I am old enough to remember that there were people who said that Lindberg crossed the Atlantic in order to take people's minds off the coming depression. I think such accusations are a typical form of American political activity, but it can be overdone.

I do not think something is bad because it comes from the middle class who happen to be in colleges with time to think, and I don't know who is going to do the thinking if it isn't done by people who have time to think, and I think to brand any activity as either black or white, rich or poor, middle class or upper class or lower class, or no class, or hippie, doesn't help very much.

I think what we have to emphasize, and what we don't do enough of is emphasize the wholeness of the problem. This is partly because the conservation movement got combined with the antipollution movement, and so we have all the bears in the picture. We must emphasize that man is building himself an environment, that we must not merely conserve air and water and earth, but we must build the place we live, and most of us live in an artificial environment, but we must build this with regard for all the resources and the handling of the natural environment.

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* From testimony before the House Select Subcommittee on Education hearings on environmental education, April 8, 1970.

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We are condemning humans to live in a dangerous physical environment. We can't keep them separate. Some people now insist that "every prospect pleases, and only man is vile," or complain "Isn't it awful that we are going to the moon when we are not doing anything on earth?" And "We are thinking about the wilds where the middle class like to go, while the poor are sweltering."

I don't think we should deal with these dichotomies. The country is rich enough in intelligence and resources to do all of these things, and the more we do of one, the more we will be able to do of another. We should not regard our present resources as if they were gold pieces and we have only 10, so if we put two into this we can't put any into something else.

Because the healthier the country is, the more people who live in the ghetto who have decent jobs and are able to buy things and keep the wheels of commerce turning, the more financial resources we devote to improving the environment.

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ECOLOGICAL CRISIS DEMANDS NEW ETHIC OF RESPONSIBILITY*

By Dr. J. George Harrar
President, Rockefeller Foundation

Environmental damage has been going on for years, but it is only recently that a general concern and a growing awareness that we are face to face with an ecological crisis have come about.

Now most of us recognize the need for immediate measures to arrest the palpable threat to the quality of life, and we realize that there is no single-formula solution to the problem.

Numerous individuals and groups in both public and private life are currently attempting, in their own ways and their own specialized fields, to cope with or at least to push back to some degree the impending crisis.

Municipal authorities, scientists, doctors, technicians, state and Federal legislators, city planners, university faculties and students, philanthropists, and corporations are increasingly involved in finding ways to prevent the further impairment of our environment, slow down its rate of deterioration, or to repair the damage done thus far.

The problem has, of course, reached its most serious proportions in the developed nations where industrialization and technology are highly advanced. Nevertheless, the crisis is beginning to assume global dimensions and is becoming a concern of the developing nations as well.

It threatens islands as well as continents, rural as well as the coastal waters, the tropics, as well as the tundras, the Volga as well as the Hudson, and the Caspian Sea as well as Lake Erie.

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* Reprinted by permission, from the Summer 1970 issue of CATALYST for Environmental Quality, 274 Madison Avenue, New York City.

Moreover, we are coming to realize that what is done to the environment in one place today is likely to affect it also in other places and at other times.

At this critical juncture, when we are finally coming to realize the hazards and dangers of our situation, it would be well for man to question the validity of his attitudes toward nature and to consider seriously the desirability and wisdom of formulating a new ethic for dealing with his natural environment--an ethic which would transcend most of the values we have traditionally held concerning our world.

The Bible tells us that God gave man dominion over all the earth and over every living creature on it. Man has misinterpreted this injunction as a license to exploit rather than a conferral of responsibility. In the last analysis, man does indeed have dominion over all the earth, but this puts him under grave obligations. Morally no society has the right to over-utilize the world's resources for its own contemporary and selfish interests. Man must understand biological systems and conduct his affairs in such ways as to improve the quality of life rather than degrade it through wanton exploitation.

It is admirable and public-spirited to be deeply committed to the well-being of the present generation of human beings who here and now inhabit the earth, and hopefully this attitude will grow and continue. It is even more commendable for men living today to become increasingly concerned about the future of their children in the face of worsening environment. But the new ethic of ecological responsibility must extend far beyond even this highly humanitarian concern. It must embody the highest responsibility of all: the ultimate responsibility for the total natural environment, the biosphere, and life itself--not human life only but all life in its varied and diverse forms.

Population Control Imperative

The first principle of the new ethic would be that man must control his own fertility. Whether we are concerned primarily with the present population of the world, with future generations, with man's survival as a species, or with preserving the stability of the entire biosphere, it is absolutely imperative that the human birth rate be curtailed.

Man's superior intelligence and his belief in the intrinsic worth of each human being do not entitle him to assume that the natural environment should be dedicated to the production and maintenance of the human race. Instead, it is incumbent on man, as the only species capable of making moral decisions, to move toward a zero rate of increase.

Today even countries that are relatively affluent and have high rates of economic growth and development are beginning to feel some of the unfortunate results of unregulated human reproduction: environmental deterioration, urban congestion, and intolerable pressures on almost all social institutions.

Millions of Americans are crowded into cities that are totally unable to meet their needs for housing, transportation, employment, education, medical services, and cultural and recreational opportunities. As these cities burgeon and increase in complexity, the demand for municipal services grows larger, and the cost of living and local taxes continue to rise without commensurate improvement in the structure and organization of the metropolitan areas. Indeed, there is evidence that in many cases, disruption and deterioration of civic life is taking place.

We cannot, of course, place the blame for the deterioration of our environment solely on population growth. A variety of socio-economic factors have also played a significant role in bringing about this situation. Nevertheless, a careful examination of the current scene suggests that many of our national problems have been exacerbated by

a rapidly expanding population concentrated in high density areas.

More and more we are coming to realize that when populations are allowed to expand beyond the maximum that a country's social and material resources can support, it is impossible for a society to concern itself effectively with the quality of life. In these circumstances, moral efforts to provide opportunities to deepen and enrich human existence tend to give way to quantitative questions of how to handle expanding numbers of people. Many sensitive and concerned individuals are convinced that the toll which excessive population growth takes of the quality of our existence is outweighing any temporary economic advantages.

Although we can hope for more rapid progress toward international recognition of the population problem and toward agreement on approaches to its solution, the battle is still far from won. Where the situation is most acute it is less understood. And although partial success may be won by persuasion and special incentives, the ultimate solution can be found only in universal understanding and social planning with world opinion united behind it.

Any and all efforts to reduce the rate of population growth in the already crowded nations depends upon the organized national effort involving extensive programs which would reach the public generally, acquaint people with the basic concepts of family planning, and facilitate direct action.

Technology Alone Can't Provide Answers

Secondly, the new ethic would also reject the premise that technology alone can provide answers to all or most of our environmental problems. It is true that technology has been a major and constructive force in the development of our society and is using its inventiveness today to provide new methods of cleaning up after itself, of controlling pollution at its source, and of reusing the residuals being produced by our present industrial system. But technology does have its limitations.

Advanced technology has a tendency to create the need for even more technology and often merely substitutes one kind of pollution for another.

It is easy to blame technology for many of our environmental ills, but it must be remembered that technological advances are often in direct response to public demand. The entire society has the responsibility of recognizing what we are doing to our environment and of making individual and collective efforts to reverse the negative effects of certain forms of technology.

We are prone to overvalue the production of nonessential material goods which rapidly become obsolescent and are eventually consigned to the already tremendous body of accumulated waste that is piling up around us. We must, of necessity, adopt self-imposed restraints by which the individual voluntarily refrains from contributing further to our ecological imbalance and is ever conscious of the need to conserve and not to destory.

Only when increasing numbers of individuals, groups, and communities recognize and accept their responsibilities and take organized action can improvement occur. Today, in this country, we have more than 200 million people, all contributing in some measure to the degradation of their environment. When these individuals can be persuaded to embrace the new ethic, to become "conservers" in the best sense of the word, a major victory will have been won.

Enrich The Quality of Life

The third principle of the ethic of responsibility for the environment is that we, in the more advanced nations at least, should put considerably less emphasis on that form of economic growth that simply multiplies production and consumption of material goods. We dwell in a finite world where many changes and processes are irreversible. Our resources are not limitless, and when those that are nonrenewable are consumed or transformed they can never be replenished.

Our present resources should be carefully husbanded and conserved. With stabilized populations, more attention and resources could and should be devoted to services and to those areas of life that enrich the quality of human existence: cultural activities, the arts, literature, intellectual and scientific pursuits, aesthetic improvements, and human relationships.

Preserve Ecological Balance

A final basic principle is that man should consider the equilibrium of the natural environment before initiating any actions that would disturb existing ecosystems. Modern technology, urban expansion, and rapid industrialization have drastically altered the ecological balance in many localities, extinguishing certain plant and animal species. Complex genetic material, once destroyed, cannot be recreated in a laboratory. Not only will the natural environment be altered and impoverished; it will become a much less varied, interesting, and desirable place for man to live.

Today all the training and education we have provided for ourselves have failed to give us an awareness of what we, whether by our passivity or by our actions, are doing to our environment and, ultimately, to ourselves. In response to population pressures and in conjunction with increasing affluence, we have destroyed much of what we like to call the great American heritage.

The past lack of understanding and imagination and unwillingness to pay the costs of protecting the future have caused our environment to deteriorate. It is virtually intolerable in several places; barely tolerable in others; and growingly intolerable wherever there are concentrations of people, their waste products, and so-called "by-products" of their industry.

Actually, there are no by-products but only residuals, materials that are discarded as uneconomic and for which we have not as yet had the ingenuity to develop economic use. As a result, untold wealth has been lost through the wasteful process of extracting a single material of commercial value while, through ignorance and lack of imagination, discarding others potentially many times more valuable.

Foresight and wisdom are badly needed. It will not be enough for political leaders, educators, and scientists to come together in an effort to repair the damage of the past, reverse destructive trends, and attempt to build pathways to a better future. Rather, every sector in the national community and the community of nations will have to participate actively and constructively in the total effort if we are to achieve success.

ELEMENTS OF A NEW ENVIRONMENTAL ETHIC*

OVER AND ABOVE specific steps to curb pollution, environmental specialists and conservationists stress what they see as the overriding need to develop a whole new environmental ethic. Among its elements, they say, should be the following:

--Man must learn to live with nature, remembering he is but one part of the subtly inter-related ecological system which links the fate of all living things.

--He must abandon the belief that unrestricted population and economic growth are necessary to progress and concern himself with the quality as well as the quantity of life.

--He must develop a philosophy in which new technology will meet ecological tests of environmental desirability, and not simply the economic test of least possible short-term cost.

--He must learn to re-use and recycle waste products, like the passenger on spaceship Earth that he is.

--He must stop looking for demons to blame for environmental degradation. Pollution is everyone's fault, the consumer as well as the producer.

--People must be willing to pay more, as both consumers and taxpayers, for a quality environment in which man can survive and life remain tolerable.

One gap asserted by environmentalists is a lack of adequate educational programs in the schools dealing with environmental quality andecological balance. As one put it, there is an urgent need for "green studies."

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*From summary statement on the 13th National Conference of the U.S. National Commission for UNESCO, November 23-25, 1969, in special issue of MEMO, publication of the U.S. National Commission.

The youth delegates at the conference reflected a generally rising concern, anger and militancy over environmental problems among young people throughout the nation.

THE CHURCH AND MAN'S RELATIONSHIP TO THE ENVIRONMENT

By Richard A. Baer, Jr., Associate Professor
and Chairman of the Department of Religion
Earlham College, Richmond, Indiana

THE CHURCH boldly proclaims that "the Earth is the Lord's and the fullness thereof," but her actions give little credence to this affirmation. In the midst of an environmental crisis of drastic proportions, the church has remained aloof and seemingly indifferent.

Too long Christians have interpreted the Genesis command the exercise dominion over the Earth as a mandate to conquer and exploit nature. So long as man possessed little technological ability to modify his environment on a large scale, such an exploitative and utilitarian attitude was only mildly destructive. But today all this has changed. The biological dominance of modern man coupled with his massive technological capabilities constitutes an unprecedented threat to the survival of life and beauty on this planet.

The church must change too. Not a few Biblical passages speak against belittling the importance of man's physical being or the value of the natural world. Christ not only came in the flesh but also devoted much of his ministry to healing the physically ill. Paul boldly proclaimed the resurrection of the body (I Cor. 15) and affirmed the redemption of nature as well as of man (Rom. 8). Isaiah (11: 6-9, 35:1-10) looked forward to the healing of nature in the day of the Lord, and the author of Revelation (21:1) anticipated a new heaven and a new Earth. The Law provided a sabbath rest for the land (Lev. 25:1-7) and for beasts of burden. (Deut. 5:12-15) as well as for man.

Insofar as the church is committed to man's becoming more fully human she cannot justifiably remain indifferent to his ravaging of nature, for when man degrades his natural environment he ultimately degrades himself as well. He forgets how

much a part of nature he really is and fails to see how deeply he wounds, himself, both physically and spiritually, when he destroys the ecological integrity, the beauty and harmony of his natural environment.

Nor can the church legitimately concern herself only with man's welfare. In obedience to the respect for the God who delights in the totality of his creation (cf. Gen. 1:31 and Ps. 104), the church must affirm the intrinsic value of all created being, quite apart from its potential for furthering man's particular interests.

The proper question is not how much ugliness and loss of environmental quality we are able to tolerate and still survive, but rather how can we structure our physical environment to achieve, both for this generation and those yet unborn, maximum human fulfillment with minimum environmental degradation. How can we live full lives now and still insure the greatest variety of environmental options for the future?

How depressing to discuss the population problem simply in terms of how many billions of people the Earth can support before there is mass starvation. Such analysis completely overlooks what kind of existence will necessarily result from such overcrowding. Similarly, to measure our economy's progress exclusively in terms of Gross National Product quite fails to take account of what one economist has termed the "disproducts" of our productive system, notably widespread aesthetic and ecological deterioration.

With prophetic urgency the church must call into question those cultural values, structures and operations which prevent man from living in harmony with his natural environment. She must challenge the gospel of efficiency and the widespread belief that technological progress in and of itself represents genuine human progress. She must insist that individual property rights never take precedence over the human rights of the community and that therefore the landowners should not be permitted to degrade the environment simply for

the sake of personal profit. She must question the military's imperious claim to our nation's natural resources and their willingness to risk massive environmental contamination - through accidental or intentional release of nerve gases, agents of germ warfare, or nuclear weapons - for the sake of dubious offensive and defensive gains. She must protest tax laws, zoning regulations and the lack of planning which make exploitative and ecologically unsound development virtually inevitable.

Finally, the church must challenge the mistaken belief that our fundamental need is for more technical knowledge. Although new technologies and more comprehensive and precise ecological understanding is badly needed, it is increasingly clear that environmental scientists already know far more about how to achieve a quality environment than we are willing to put in practice. Much water pollution, for example, is the result of nothing more than local taxpayers' unwillingness to fund adequate sewage treatment facilities.

In a culture where men too often feel compelled to prove themselves by dominating and exploiting their natural environment, the church must proclaim anew the possibility of a life lived by the grace of God. In a society which is so strongly committed to work and utility, achievement and success, the church must witness to a God who ordains a sabbath for man's leisure and fashions Leviathan, the great ocean dragon, "to play in the sea." Man must learn to delight in and enjoy the Earth as well as use it.

The church must seek to awaken and alert an apathetic public to the seriousness of the present ecological crisis. She must call upon those in positions of political and economic power to initiate and support more enlightened environmental policies and legislation. Christian educators must foster a new ecological awareness and sense

of environmental responsibility, beginning with children in the earliest grades of church school.

Finally, Christians will personally need to demonstrate a new attitude towards natural resources and material possessions through a life style which refuses to measure value mainly in consumptive and quantitative terms. Not based on an attitude of world denial, such a life of restraint rather would presuppose both the goodness of creation and the right of future generations to the full enjoyment of it.

Failure to fulfill our obligations as faithful trustees of the gifts of God's creation will inevitably bring God's judgment upon us. The Earth itself will rebel against our greedy and thoughtless exploitation of nature and our irresponsible fecundity.

The battle will not be easy. In most cases victories will be provisional, insofar as an environment saved can always later be destroyed. Defeats will frequently be final. There is no time for delay. Because of the irreversibility of much environmental impairment, refusal to act now will in itself constitute our decisive commitment to further exploitation and degradation.

THE VALUE OF GOOD DESIGN

By Nathan Cabot Hale*

The boundaries of good conscience, good design, and good business extend to all fields of human endeavor--even to commercial products. All men are involved in production and commerce, and design problems touch every aspect of human life. Nature herself is the basis for design; there is nothing man can devise that cannot be found already expressed in nature.

We must realize that it is not design problems but the structure and direction of our age which are new. It is in the understanding of the character and necessity of our time that we determine what good design is. But since man is a creature of expanding scope and ability, what nature provides by herself is no longer sufficient for his needs. We are learning to extend nature's principles in such a way that our works will fit harmoniously into our natural environment and not destroy the source of our riches.

Our ability to consume has reached tremendous proportions. The balanced metabolism that nature provides--the self-regulating replenishment of energy and resource--has been thrown out of kilter by the consumption of resources. We have developed not only a life of plenty but also a society of thoughtless waste. Therefore, if we are to investigate the problem of design in its fullest sense, we must take into consideration our stock of resources and our natural environment. We must design keeping long-range goals in mind and considering wisely the needs of the men and women of the future. This is the enlarged responsibility of the designer of today and a primary factor of our time. Waste is ugly and will cost the human race dearly if not thoughtfully prevented. Durability, then, is an answer to this.

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* Mr. Hale is a sculptor in New York City

We are all aware that there is much more to business than getting five for three and not three for five. The problem is how to keep getting five for three consistently in order that our products may continue to be put on the market. There are many important meanings hidden in the profit having to do with the source of natural fruitfulness. There is an extra added something in a product that makes it morally justifiable to charge more for a thing than its actual production cost. It is in this area of intangible value that we find some of the most important aspects of the meaning of good design.

For instance, take a type of corkscrew which I purchased some time ago. It extracts the cork so easily from the bottle that one does not need much strength or agility. No muscle-building courses are required before one is able to use it. This is not the case with those ten-cent "knuckle-busters" we're all familiar with. This corkscrew never fails--except in those rare cases where the substance of the cork has decomposed. I am convinced that there is no finer corkscrew in any home in the land regardless of the householder's wealth or position.

The price of the corkscrew was very high--about $1.50. However, I made the purchase and have had years of pleasure and esthetic satisfaction--satisfaction that is just plain not to be found in the ten-cent version. Had I regarded the initial cost as prohibitive, I would never have known these satisfactions.

Now, you may say that all this is very minor, trivial, and silly; but a large part of life is made up of such little things. From the point of view of dollars and cents, maybe my corkscrew's cost was extravagant compared with that of the cheaper one. But something made me leap this barrier and throw economic caution to the winds. That something was the object's design: its inherent rationality, its logicalness of structure, its purposeful craftsmanship.

Things that work well and hold up under use either already are or eventually come to be considered beautiful. We value them in countless personal ways that others may never understand because of the time we have lived with them and for the many things which good association might recall. If, for example, someone should make off with my corkscrew, I'd feel much worse than if I'd lost a dollar and a half. On the other hand, I could lose one of the cheaper variety every day for a year and never feel anything but annoyance and irritation.

The extremely ugly object is never a serious problem, for it is extreme and therefore very easy to recognize and reject. It is the "not so bad," the passable utilitarian product, that is poisonously ugly and costly in the long run. Because it at least gets by and is workable in its situation, it tricks and deludes us into thinking we have profited or are saving, whereas what we have really done is to be sparing and stingy. A whole chain of events can take place of which we are generally unaware and unable to do anything about. This chain of events is brought on by an indifference and lack of concern that are always the result of mediocrity.

This indifference starts with a mediocre design. Someone makes a passable product that will get by but in which there is an inherent detachment from the purpose of the object. It goes on the market, and we may buy it rather thoughtlessly or carelessly because we are not always on guard but are often very humanly trusting. We take the product home and use it for a while-and it may do the job. However, it somehow never delights us. We become more or less indifferent to it, not realizing that we have been cheated and misled into not having something that we really fully like and enjoy. I do not imply that this is on a conscious level; it is more on the subliminal level as are many of the things we do automatically. But the corkscrew shows that trival, automatic little things can give us a sense of pleasure and meaning.

A large part of people's lives may be spent using objects or living in buildings that are passable in every way but the most important way. From a continual, year-by-year repetition of living with this make-do design, a feeling may develop that no one really cares much about anything and that life is a cold, machine-like process. This may happen in a seemingly prosperous and affluent society, thus adding to the feeling of hopelessness. When such a thing occurs, it is quite easy to understand why fortunes are made selling tranquilizers and remedies for "tired blood." Unfortunately, these are not panaceas for generalized social indifference to the meaning of quality. There is no pill that can put zest into a poorly designed product.

If we can say that our city or our country or our neighborhood has ceased to be beautiful, it is probably because of inadequate, irresponsible, corner-cutting design. Until fairly recently one could find some respite from the poor planning of mankind in nature, for up until just a few years ago our country was not the real estate tract or industrial site that it is today. Now, more than every before, man's will is affecting nature's metabolism--even on an atmospheric, global scale.

We can no longer afford to be poor designers. We are too crowded and are becoming more so. To exercise poor judgment means to influence more people badly now as well as in the future. Man's impulses to build and design are basically very wholesome ones; but without complete knowledge and without the full feeling of responsibility, these impulses often unwittingly become destructive.

The very fact that we can speak of a country of the size of ours as becoming ugly is a measure of the seriousness of the problem. The old frontier days are over, and the Wild West buckaroo or the industrial pirate are as out of date as the feudal nobility. We can no longer pluck and plunder where we will by makeshift design. One can only design today with knowledge, a long-range point of view, and a consummate respect for human life and need. Conscience must not allow us to release our products until we are certain that

we have made every possible effort to excel.

Some cynic may quote the line from Gilbert and Sullivan which goes, "When everyone is wearing silk, up goes the price of shoddy." This may be, but I choose to think that quality and excellence can condition and change society. If this were not so, we might still live in caves and dine on grubs. I see nothing wrong in a nation or a world of people who expect and demand the best. The fine designer, the thoughtful and studious man, or the fine craftsman may not have great celebrity in today's world, but he has a most vital part to play in creating the world of the future.

There are today many men who operate on society's fringes, men who think and sell cheap. I realize that there is an actual market (and a large one) for cheapness and ugliness in art, architecture, automobiles, and countless other products; but the fact that this condition exists does not morally, ethically, or esthetically justify pandering to this market.

The producer--and not the consumer--is responsible for the design level of his field. The fact is that the value and cost of our products must be measured not by money alone but in the light of the fact that they can make lives either pleasant and full or dreary and meaningless. If we can acknowledge this, we have learned the real cost of ugliness.

There is no formula for good design except the intentions of the producer, his scope of understanding or nature's functions, and his design to give the best of himself. Fineness of quality and design may initially be more expensive in money, but high quality and excellent design make living profitable in terms of pleasure.

THE DISCOVERY METHOD OF TEACHING*

By Mrs. Arlene Weisberg, Bronx Teacher,
Master Teachers Program, Wave Hill Center
For Environmental Studies

A child who has had the responsibility for planning or maintaining an aquarium in the classroom may be better equipped to understand the problem of water pollution in terms of own experiences.

In order for the child to understand today's environmental problems, air pollution, water pollution, waste pollution, noise pollution, he must first understand the interrelationship of things, of himself and all of nature. Education must be presented not as a set of separate subjects but rather as an integrated approach to everyday living.

A small group of children want to keep a gerbil in the classroom. This activity involves building a cage, finding out when and what to feed him, his habits etc. This one activity involves mathematical measurements, following instructions, reading, science, working with tools and money values. The classroom emphasis is not broken down into math, science, reading and arts and crafts but the integrated emphasis is upon how to solve the problem of housing a gerbil. The child who perceives a problem and works through to a solution learns to value himself and to value his place in the environment. Any degradation of the environment becomes a degradation of himself. We do not want to raise a generation of young people who think of themselves as separate entities, as apart and distinct from the environment and who think nothing of disposing of their litter along streets and public highways.

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* From testimony before the House Select Subcommittee on Education hearings on environmental education, April 11, 1970.

Many children in the inner-city are "turned-off" from school. One of the strongest arguments has been that school has no relevance to the outside world. The discovery method uses that which interests the child, that which is relevant to him, his immediate environment. In the process of exploring the immediate environment, the child begins to form judgements. Some things in the environment are undesirable. How can we improve the undesirable elements or prevent them from occurring in the future? The child who has been encouraged to experiment and fail and try something else, will have the courage and self-assurance to become a change agent in his environment.

AMERICAN FAITH IN EDUCATION*

Our faith in education as a cure for almost any trouble has been called one of the great American illusions. It is--if "education" is taken to mean only passive, formal schooling. But if it is broadened to include learning by experience as well as learning from books, then the American faith in education is simply one manifestation of the American faith in democracy. For democracy is at bottom a belief in the improvability of mankind, in the capacity of the human race as a whole to grow in wisdom and moral strength. The founders of the republic believed in democratic government as potentially the greatest of all educative forces--the only one in which every man and woman and boy and girl in the land is involved, and can participate, personally and directly.

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*From "Our Form of Government," a supplement to FORTUNE, November 1943